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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/755,983	01/13/2004	Nobuaki Takahashi	NEC 03FN050	2252
27667	7590	05/31/2006		
HAYES, SOLOWAY P.C. 3450 E. SUNRISE DRIVE, SUITE 140 TUCSON, AZ 85718			EXAMINER TRINH, MINH N	
			ART UNIT 3729	PAPER NUMBER

DATE MAILED: 05/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/755,983

Applicant(s)

TAKAHASHI ET AL.

Examiner

Minh Trinh

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 January 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>3/22/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. The following title is suggested: --"Method for forming contact bumps for PCB"--.
2. The abstract should have been modified to reflect method invention.

Claim Objections

3. Claim 2 is objected to because of the following informalities:
"should be formed" (claim 2, line 4) is not a positive method limitation the use of:
--is formed—is suggested.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

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2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicants Admitted Prior Art (APA), (see Figs. 1a-c) in view of Takushima (6,454,159).

APA, as depicts in Figs 1a-c shows substantially every limitation of claim 1 where a resist 13 having an opening, and the forming conductive layer 12 in the opening of the resist 13, forming a bump electrode on the wiring board (WB) by aligning an electrode pad 16 formed on said WB 15 with conductive layer (see Figs. 1d). APA does not teach the transferring of conductive layer to the and then transferring the conductive layer to the electrode pad, however, the Takushima discloses above where the transferring conductive layer 20 to the electrode pad or bump (see Figs. 1b-c). Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to employ the Takushima's teaching as described above onto the method invention of APA in order to form a electrical connecting structure can be adjusted by setting and can be easy to controlled.

As applied to claim 2, noting APA's Figs. 1a-b does show the base having a pit for forming conductive layer therefrom.

6. Claim 1-2 is also rejected under 35 U.S.C. 103(a) as being unpatentable over Applicants Admitted Prior Art (APA), (see Figs. 1a-c) in view of Suzuki et al (6,454,159).

APA, as depicts in Figs 1a-c shows substantially every limitation of claim 1 where a resist 13 having an opening, and the forming conductive layer 12 in the opening of the

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resist 13, forming a bump electrode on the wiring board (WB) by aligning an electrode pad 16 formed on said WB 15 with conductive layer (see Figs. 1d). APA does not teach the transferring of conductive layer to the and then transferring the conductive layer to the electrode pad, however, the Suzuki et al disclose that where the transferring conductive layer 3 to the electrode pad or projection 6(see Figs. 1b-c). Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to employ the Suzuki's teaching as described above onto the method invention of APA for forming conductive bump on the substrate (see process Figs. 5c-5e).

7. Claims 3- 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicants Admitted Prior Art (APA) or Takushima.

As applied to claims 3-5 and 6, regarding the material selection for the base and the conductive layer as recited in claims 3-5, and the plating as recited in claim 6. It would have been an obvious matter of design choice to choose any desired material and the plating techniques, since applicant has not disclosed that the material as claimed in each of claims 3-5, and would solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with the use of Si as the base substrate along with solder layer or conductive film as conductive layer as taught by the combination prior art references (i.e., see APA's pages 1-2).

Limitations of claims 4-6 are also met as the above discussion.

As applied to claim as 7-13, regarding the size , shape and form configurations as recited in claims 7-13. It would have been an obvious matter of design choice to choose any desired size, shape configurations for the since applicant has not disclosed that the size and shape as recited in these claims would solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with the aspect ratio configurations as taught by each of the prior art references.

Furthermore, it would have been an obvious matter of design choice to make the different portions of the component such as where the conductive layer formed is rough along with the size or shape configurations as recited in claims 7 and 9-13, etc of whatever form or shape was desired or expedient. A change in form or shape is generally recognized as being within the level of ordinary skill in the art, absent any showing of unexpected results. *In re Dailey et al.*, 149 USPQ 47.

Limitations of claims 8-13 are also met as the above discussion.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art cited for their teachings of forming connecting structure for PCB or the like.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Minh Trinh whose telephone number is (571) 272-4569. The examiner can normally be reached on Monday -Thursday 8:00 am to 4:30 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on (571) 272-4690. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

mt

5/23/06


MINH TRINH
PRIMARY EXAMINER